

REMARKS

Claims 1-57 are pending. Claims 1-24 and 54-57 were previously withdrawn from consideration, following a traversed restriction requirement. Applicant hereby cancels claims 1-24 and 54-57. Applicant reserves the right to pursue those claims in future prosecution. Claims 25, 27, 47, 49, and 52 are hereby amended, claims 26, 28, and 51 are hereby canceled, and claims 58 and 59 are hereby added. No new matter will be incorporated into the present application by entry of this Amendment. If the Office determines that any additional fees are deemed to be necessary with the filing of this Amendment, then the Office is authorized and requested to charge such fees to Deposit Account No. 061910.

In the Office Action mailed July 17, 2006, the Examiner restricted the application to claims 25-53, drawn to methods of producing gemstone material; withdrew from further consideration claims 1-24 and 54-57, drawn to gemstone materials; rejected claims 25, 28, 37-42, and 49 under 35 U.S.C. 103(a) as being unpatentable over Cabo (US 2003/00149888) in view of Argoitia (US 6,749,936); rejected claims 26, 27, 29-31, and 32-36 under 35 U.S.C. 103(a) as being unpatentable over Cabo and Argoitia and in further view of Gajewski (5,208,080); rejected claims 43-47 under 35 U.S.C. 103(a) as being unpatentable over Cabo and Argoitia and in further view of Phillips (5,424,119); apparently rejected claim 48 under 35 U.S.C. 103(a) as being unpatentable over Cabo and Argoitia and in further view of Phillips (5,424,119) and further in view of an alleged prior art practice in the art of spin coating; apparently rejected claim 50 under 35 U.S.C. 103(a) as being unpatentable over Cabo and Argoitia and in further view of Phillips; and rejected claim 53 as being unpatentable over Cabo and Argoitia and in further view of Phillips and further in view of Gajewski. Applicant respectfully requests reconsideration of these rejections in light of the following remarks and/or amendments.

All the rejections in the Office Action are based on alleged obviousness. To properly establish a prima facie case of obviousness, MPEP § 706.02(j) identifies three basic criteria that must be met. First, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. Second, there must be some

suggestion or motivation in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or combine reference teachings. Finally, there must be a reasonable expectation of success. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In connection with independent claim 25, this claim has been amended to require heating the laminate under vacuum to an elevated temperature of between about 600 degrees Celsius and about 850 degrees Celsius, such that the plurality of dichroic particles become fused between the sheet-like substrates, thereby producing a slab of the gemstone material. The Examiner rejected claim 25 as being unpatentable over Cabo in view of Argoitia. As acknowledged by the Examiner in his rejections of the original dependent claims that involved heating under vacuum, the proposed Cabo-Argeitia combination would not involve heating under vacuum. The Examiner cites Gajewski as showing a method that involves heating under vacuum. However, combining Cabo, with Argoitia, and then with Gajewski, clearly does not yield the method claimed by amended claim 25. The Examiner alleges that, in the proposed combination, the particles from Argoitia would be incorporated into the ceramic paint of Cabo. Then, apparently, the resulting assembly would be subjected to the vacuum heating process of Gajewski. That proposed combination, however, does not satisfy the expectation-of-success requirement for an obviousness combination. That is, people of ordinary skill in the art would not expect success in starting with the laminate assembly of Cabo and then treating that laminate assembly with the vacuum heating process of Gajewski.

The goal of Cabo is to provide a ceramic panel that has a dark spot within the panel. See, e.g., Cabo, Page 1, paragraph 6. Ceramic paint is applied to the facing surfaces of the laminate assembly. Thereafter, a layer of material 24A, 24B, 24C is applied to an external surface of the laminate assembly. That layer of material increases heat transfer into the ceramic paint. The laminate assembly is then conveyed through a furnace, in which the laminate assembly is first heated slowly at approximately 500 degrees F per hour until reaching about 775 degrees F to about 925 degrees F, then the laminate assembly is heated rapidly at about 1200 degrees F per hour until reaching a

fusing temperature of between about 1300 degrees F and about 1600 degrees F. The laminate assembly is then soaked at fusing temperature. Then, the glass may be cooled rapidly down to the annealing range of about 1000 degrees F, such as by venting the furnace. The laminate assembly is then held at constant temperature for an annealing period. The laminate assembly is then cooled from the anneal soak temperature to the strain point. The final stage is to cool to room temperature, which of course proceeds slowly enough to prevent shattering.

Cabo expressly indicates that it is not understood why and how the layer of material 24A, 24B, 24C works to produce the dark spot. See, Cabo, page 3, paragraph 36. In particular, Cabo states:

Referring particularly to FIG. 4 the now fused glass sheets 12A and 12B, indicated by numeral 26, it can be seen that a dark spot 28 is produced at the fused surface 30 between the glass sheets 12A and 12B. It is not completely understood why and how the layer of material 24A, or 24B, or 24C work. However, it is believed that the layer of material 24A, or 24B, or 24C increases the heat build-up within the interior of the glass sandwich causing the ceramic paint layers 18 and 20 to oxidize or other wise be destroyed producing the dark area or spot 28. (Emphasis added)

Those teachings clearly do not provide the necessary expectation of success. That is, the Cabo reference if anything, teaches away from any expectation that success would be achieved in starting with the Cabo laminate assembly, and then deviating from the specific furnace-heating protocol taught in Cabo in favor of the vacuum-heating protocol taught by Gajewski. Cabo suggests that oxidation plays a role in forming the dark spot during the furnace-heating protocol. If anything, skilled artisans would expect that drawing the vacuum on the laminate, as taught by Gajewski, would tend to minimize the availability of oxygen, which Cabo suggests may be required to form the desired dark spot. To make a proper obviousness rejection, the references must provide skilled artisans with a reasonable expectation of success. In this case, Applicant considers that

the teachings of Cabo show that skilled artisans would not expect success in performing the vacuum-heating process of Gajewski or the laminate of Cabo.

Moreover, even if the Cabo were combined with Argoitia, and then further combined with Gajewski, as proposed by the Examiner, the resulting combination would not achieve the method recited in amended claim 25. In particular, the proposed combination would not involve heating the laminate under vacuum to an elevated temperature of between about 600 degrees Celsius and about 850 degrees Celsius. If the proposed combination were made, then the resulting method would apparently involve the particles of Argoitia being incorporated into the ceramic paint of the Cabo laminate assembly, which would then be subjected to the vacuum-heating process of Gajewski.

The Gajewski process is alleged to eliminate wrinkling, air bubbles, and moisture in the laminate. The process is specific. It requires first cooling the laminate, then subjecting the cooled laminate to a vacuum, then subjecting the laminate to a vacuum-heating process, and finally subjecting it to autoclaving. In particular, Gajewski's vacuum-heating process teaches heating to between 250 degrees F and 360 degrees F, such that the laminate emerges at about 150 degrees F. Those temperatures are far below the range required in claim 25. In particular, claim 25 requires heating the laminate under vacuum to an elevated temperature of between about 600 degrees Celsius and about 850 degrees Celsius. 600 degrees Celsius, of course, is equal to 1112 degrees Fahrenheit. Thus, the claimed vacuum heating method involves a far higher temperature range than that which would be used if the Gajewski vacuum heating process were used on the laminate assembly of Cabo, as proposed by the Examiner. Thus, amended claim 25 provides clear definition over any combination involving Cabo and Gajewski.

Still further, amended claim 25 requires cutting the resulting slab into a plurality of faceted gemstones or cabochens. The idea of using this type of laminate assembly by cutting it into faceted gemstones and/or cabochens is highly unusual. Applicant considers that there plainly is no suggestion of this method step in any of the cited

references. Thus, amended claim 25 includes numerous inventive features that provide clear definition over any combination involving Cabo and Gajewski.

In view of the foregoing remarks concerning amended claim 25, Applicant considers that all the dependent claims based on independent claim 25 (i.e., dependent claims 27, 29-46, and 58) also are clearly patentable over any combination involving Cabo and Gajewski.

In connection with claim 47, this claim has been rewritten in independent form. In particular, this claim now incorporates the limitations of both original independent claim 25 and original dependent claim 47. Also, amended claim 47 specifies that the sheet-like substrates are glass or crystal. Dependent claim 47 was rejected on an obviousness basis using a proposed combination of Cabo, and Argoitia, and Phillips, and a web page of unclear origin.

Amended claim 47 requires providing a laminate comprising two glass or crystal sheet-like substrates between which dichroic particles are provided. The laminate is heated to an elevated temperature such that the dichroic particles become fused between the glass or crystal substrates. The claimed method also requires arranging the dichroic particles in a substantially uniform orientation by rotating the laminate.

The Examiner apparently alleges that the particles of Argoitia should be incorporated into the ceramic paint of Cabo, and that, due to the teachings of Phillips about putting shear on particles in an extruded or casted polymer by either stretching the polymer in two different directions or by extruding the polymer directionally, the spin coating method of the noted web page should be performed on the Cabo-Argeitia laminate. This proposed combination, however, lacks numerous elements of the analysis required for a proper obviousness rejection.

The person of ordinary skill in the art would certainly not expect success by taking the laminate of Cabo and attempting to apply the methods taught by Phillips for

stretching or directionally extruding polymer so as to orientate particles in the polymer. To the contrary, attempting to stretch the laminate in two directions somehow, or attempting to somehow directionally extruding the laminate, would not be expected to yield success. The Examiner seems to allege that Phillips would provide a general teaching that one should put objects under shear to orient particles in those objects. That suggestion, however, is far too general. Phillips is concerned with extruding or casting polymer. Skilled artisans would not expect that the extruded/casted polymer teachings of Phillips should be extended to the production of glass or crystal laminates bearing ceramic paint. Moreover, Phillips emphasizes that it is important to provide mechanical movement of the polymer during biaxial orientation. See, e.g., Phillips, column 4, lines 54-60. The spin coating method of the noted web page, however, would not be expected to provide such mechanical movement during biaxial orientation.

The Examiner apparently suggests that the teachings of Phillips would lead skilled artisans to use the spin casting coating method of the noted web page. Applicant does not consider there to be a sustainable motivation to combine the teachings of the web page's spin casting method with the extruded/casted polymer teachings of Phillips, much less in a further combination with Cabo. The web page deals with spin casting, which is a well known method for depositing coatings. The web page states:

Uniform films with thicknesses on the order of micrometers are readily produced industrially. There are two main applications for this process:  
(1) the production of ultrathin photoresist films (with thickness less than 200 nm) necessary for the manufacturing of microelectronic devices and  
(2) the deposition of magnetic dispersion on aluminum substrate during the production of magnetic memory devices. (third paragraph)

Applicant submits that the teachings of Phillips do not provide the required motivation to adopt the spin coating method of the web page. Phillips clearly teaches that mechanical movement is required during biaxial orientation. Since the spin casting of the web page involves uni-axial direction of acceleration (toward the center of rotation), the teachings

of Phillips about needing biaxial orientation do not provide the required motivation to combine. Rather, they teach against that combination.

Thus, Applicant considers that amended independent claim 47 cannot be considered as being an obvious combination of Cabo, Argoitia, Phillips, and the noted web page. Applicant considers the same to be true for dependent claim 48, which depends from independent claim 47.

Insofar as independent claim 49 is concerned, this claim has been amended to require heating the laminate under vacuum to an elevated temperature of between about 600 degrees Celsius and about 850 degrees Celsius. Applicant has explained the clear basis for the patentability of these features in connection with amended claim 25. In particular, the claimed vacuum-heating method involves a far higher temperature range than that which would be used if the Gajewski vacuum-heating process were used on the laminate assembly of Cabo, as proposed by the Examiner. Thus, Applicant believes the claimed step of heating under vacuum to an elevated temperature of between about 600 degrees Celsius and about 850 degrees Celsius provides clear definition over any combination involving Cabo and Gajewski.

Moreover, the Examiner has not established a prima facie case of obviousness for original claim 49. As noted above, one of the requirements for making a prima facie case of obviousness is that the prior art references when combined must teach or suggest all of the claim limitations. (Emphasis added). In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The proposed combination of references does not have all the limitations of original claim 49. In particular, the proposed combination does not involve separating the particles into different groups of differently sized particles, and then combining particles from such different groups and using the resulting mixture between the sheets of the laminate. This provides a recipe-based approach to the laminate, which allows a given “look” to be repeated in different batches, for different products, etc. The proposed

combination merely involves the particles being sifted through a sieve. That simply assures the particles will be smaller than a certain size. It does not accomplish the step of separating the particles into multiple groups of different particle size, and then combining some particles from one of the groups with some particles from at least one other group, so as to have a repeatable size distribution of particles from at least two different size ranges.

Thus, Applicant considers there to be numerous clear reasons why amended independent claim 49 provides patentable distinction over any combination of the cited references. Applicant considers that the same is true of dependent claims 50, 52, and 53, which depend from independent claim 47.

In view of the foregoing amendments and remarks, it is submitted that all the claims of the application are in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested. The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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